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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,647	08/10/2001	Takao Nakazaki	058856-0105	4454

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EXAMINER

GLASS, CHRISTOPHER W

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 05/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/925,647

Applicant(s)

NAKAZAKI ET AL.

Examiner

Christopher W. Glass

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,5,7-9 and 13-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,7,9 and 13-17 is/are rejected.
- 7) ☒ Claim(s) 5 and 8 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 20 February 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed February 20, 2003 have been fully considered but they are not persuasive. On page 8, applicant argues that "De Missimy does not disclose a device as recited in claim 1", due to the nature of the configuration of holders and optical modules. However, the examiner disagrees, and maintains that the device as claimed in claim 1 remains anticipated by the disclosure of De Missimy. The light curtain generating device of Figure 1 of De Missimy specifically shows the limitations of this claim, including light emitting and receiving pillar assemblies, groups of single-beam optical modules comprising associated lenses and emitters or receivers, and each pillar case accommodating a base frame having optical modules mounted thereon. Pages 7 and 8 of applicant's remarks make reference to alleged "attendant advantages" associated with the fabrication of the claimed invention. However, the examiner holds that these advantages are not present in the form of functional limitations that would hold patentable weight in the claim language and differentiate applicant's invention from the prior art, but rather only refer to issues of manufacturing the device. Applicant argues in the remarks at the bottom of page 8 and top of page 9 that the claimed invention is not unpatentable over the teachings of De Missimy, in view of Blau or Buitkamp, contending that "Neither Blau or Buitkamp cure the deficiencies of De Missimy", because these references "fail to disclose a device as recited in claim 1". As stated above, the device of claim 1 remains anticipated by De Missimy, and the teachings of Blau and Buitkamp were incorporated in the rejection of claims dependent upon claim 1 in order to show that plastic holder-type components and variable pitch of module arrangements, among other aspects as claimed, are well known in the art. Applicant

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also addresses claims 9 and 7 (order in which they appear in remarks on page 9) and argues that the subject matter of these claims is patentable due to dependence upon claim 1 “as well as for patentable features recited in those claims”. The examiner again disagrees. The subject matter of claim 9, which concerns the signal processing means and operation thereof, is disclosed by De Missimy in Figures 2 and 6, and Column 2, lines 32-37. The examiner also holds that the subject matter of claim 7 involves obvious modification of the disclosure of De Missimy and is therefore not patentable. All pending claims in the application are anticipated or unpatentable over previously referenced prior art, according to the following rejections, which are deemed proper.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1,2,9, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 3,805,061 to De Missimy et al. (hereafter De Missimy).

Regarding claim 1: Shown in Figure 1 is a light curtain generating device, comprising a light emitting pillar assembly accommodating an array of light emitting units **8** within a pillar case **2** and a light receiving pillar assembly accommodating an array of light receiving units **18** within a pillar case **4**, the light emitting pillar assembly and light receiving pillar assembly being placed opposite to each other so as to form a light curtain for detecting an object between the pillar assemblies, characterized in that the light emitting unit array **8** and light receiving unit array **18** accommodated in the respective pillar cases **2** and **4** each comprise a group **6(A-C)** or

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16(A-C) of single-beam optical modules. Each single-beam optical module comprises a single light emitting unit or a single light receiving unit comprising a lens **14** or **24**, an optical element (light emitter **8** or light receiver **18**) and a holder integrally incorporated with the lens and optical element so as to align the lens and optical element with a prescribed optical axial line, and the holder being separated from holders of other single-beam optical modules. Each pillar case accommodates a base frame (having back panels **10** and **20**, and mounting panels **12A-C** and **22A-C**) defining mounting positions for a plurality of single-beam optical modules, and each single-beam optical module is mounted in the mounting position of the base frame.

Regarding claim 2: Each opposing pair of the light emitting unit and light receiving unit perform a detecting action in a prescribed order (see Column 2, lines 27-50 and especially lines 33-37, as well as Column 3, lines 21-26).

Regarding claim 9: As shown by Figure 1, the light curtain generating device of De Missimy comprises a circuit board having a plurality of optical element mountable positions, and signal processing means (shown in Figures 2 and 6) for electrically and selectively disabling the optical element mountable positions (see Column 2, lines 32-37).

Regarding claim 13: Each pillar case accommodates at least two base frames arranged in series along a length of the pillar assembly (see discussion of grouped assemblies in Column 4, lines 47-63).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over De Missimy, in view of U.S. Patent No. 5,302,942 to Blau. The holder (section shown in Figure 1 imbedded with optical elements **8,18** and lenses **14,24**) of the light curtain generating device of De Missimy is not specifically taught as being made of plastic material. However, it is well known in the art to use plastic in the construction of such elements. Figure 5 of Blau shows a light curtain system having a “molded plastic support **64**” on which are formed sockets for the light receiving and emitting elements. It would have been obvious to one having ordinary skill in the art at the time the invention was made to compose the holder with plastic in the device of De Missimy, due to this material’s light weight, potential rigidity, and low cost. Further, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

6. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Missimy. The base frame of De Missimy comprises plate members (e.g. back plates **10,20**, mounting plates **12A-C and 22A-C** and side plates composing the pillar cases **2,4**), and each single-beam optical module is attached to the plate members at a side of the single-beam optical module extending in parallel with the optical axial line. The plate members are not specifically taught as being made of metallic material. However, it would have been obvious to one having ordinary skill in the art to use metal in forming these elements, due to this material’s rigidity and electrical conductive properties. Further, it has been held to be within the general skill of a

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worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

7. Claims 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over De Missimy, in view of U.S. Patent No. 6,175,106 to Buitkamp et al. (hereafter Buitkamp). The device of De Missimy does not specifically teach some of the mounting positions for the emitting and receiving optical modules as being empty, or the arrangements as staggered between the presence and absence of such elements. Also, De Missimy does not expressly disclose the mounting positions of the base frame members (including panels **12A-C** and **22A-C**) as having different pitches, or the base frames as having different numbers of mounting positions or lengths (compared to the other corresponding base frame/panel). It is well known in the art to employ arrangements of staggered or open mounting positions with or without optical modules, however. Figures 1 and 4 of Buitkamp show a light grid, having a transmitting strip **2** and corresponding receiver strip **3**, comprising optical modules with emitter elements **7** or receiver elements **15** mounted on circuit boards **6,14**. “Basically, it is not necessary to fit out all the mounting locations provided on the circuit boards **6,14** with transmitter and/or receiver elements **7,14**. For example, only every second mounting location can be equipped”(Column 8, lines 14-17). It would have been obvious to one having ordinary skill in the art at the time the invention was made to implement such a setup in the device of De Missimy in order “to produce different light grids” and therefore create different light arrangements to fit a specific application-specific need, such as only providing light beams only in areas of a machine where object detection and safety is a concern (Column 8, line 23). It also would have been obvious to arrange the mounting positions on each base frame/panel member in different configurations in terms of

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pitch, number, and length; such variation would offer the above-mentioned advantages, as well as allow more possible combinations of emitter-receiver placement further adapting the device to operate in various environments by providing more allowed beam positions without wasting locations that might be obstructed.

Allowable Subject Matter

8. Claims 5 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the main reason for allowance of these claims would be the limitation of the snap-fit arrangement. While there does exist prior art showing similar optical modules used in light curtain generating devices, it is the examiner's opinion that it would not have been obvious to one having ordinary skill in the art to provide these elements in a snap-fit, and therefore non-permanent or non-soldered configuration, in a device having all other aspects of this claim and the claims upon which they are dependent.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

U.S. Patent No. 6,518,565 to Wu et al. discloses a sensor assembly having a plurality of optical modules with lenses, light sources, and corresponding light receiving elements arranged within a housing.

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10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher W. Glass whose telephone number is 703-305-1980. The examiner can normally be reached 9:30am-6:00pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached at 703-308-4852. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

cg
May 1, 2003


STEPHONE ALLEN
PRIMARY EXAMINER